

REMARKS

Claims 25-48 are all the claims pending in the application.

I. Response to Rejection of Claims 25-48 Under 35 U.S.C. § 103(a)

Claims 25-38 and 40-48 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Spears et al. (US 6,455,148) in view of Botros (US 2004/0116602).

In addition, claim 39 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Spears in view of Botros, and further in view of JP 56-132709.

Applicants respectfully traverse the rejections.

Claim 25 is directed to a metal laminate comprising between two outer metal sheets an adhesive polymer layer, characterised in that the adhesive polymer layer comprises cross-linked polyethylene or a copolymer thereof, co-grafted with a silane compound and with an unsaturated carboxylic acid and/or a derivative thereof.

Spears discloses a composite comprising two metallic skin layers bonded to a plastic core comprising a foamed polyethylene. An adhesive polymer layer can be provided between the skin layer and the plastic core. *See* col. 2, lines 13-15. The adhesive layer is made of a maleic anhydride modified polyethylene. *See* col. 4, lines 55-58.

As acknowledged by the Examiner, Spears does not teach an adhesive polymer layer which comprises a cross-linked polyethylene grafted with an organosilane compound and with an unsaturated carboxylic acid and/or a derivative thereof.

To make up for the deficiencies of Spears, the Examiner relies on Botros. Botros relates to adhesive compositions having an improved adhesion to metals and elevated temperatures. These compositions comprise a polyolefin base resin, a grafted modified polyolefin and a silane modified polyolefin.

The Examiner asserts that the silane modified polyolefin corresponds to the silane compound and that the modified polyolefin corresponds to the grafted unsaturated acid or derivative of claim 25.

Applicants respectfully disagree and it is respectfully submitted that Botros does not teach or suggest a cross-linked polyethylene or a copolymer thereof, or co-grafting with a silane compound and with an unsaturated carboxylic acid and/or a derivative thereof.

As disclosed in the specification, crosslinking of polyethylene occurs upon hydrolyzation of the co-grafted silane groups via siloxane groups. *See* [0070] of the published application (US 2007/0104966).

Botros does not refer to any hydrolyzation treatment of the adhesive composition comprising grafted silane groups, nor to another process for crosslinking polyethylene. Crosslinked polyethylene (PEX) is mentioned only as a material which the adhesive blend may bond to aluminum. *See* [0039] of Botros. Thus, Botros does not teach or suggest the claimed adhesive composition including a cross-linked polyethylene.

In addition, the composition disclosed in Botros is a blend of a base resin with two different functionalized polyolefins. *See* [0014] of Botros.

In contrast, the present invention specifies an adhesive polymer layer comprising polyethylene which is co-grafted with two different compounds. Co-grafted polyolefin differs from a blend comprising a base resin and two different mono-grafted polyolefins. Indeed, co-grafting implies simultaneous grafting of the polyolefin with both specified compounds. It is to be expected that both co-grafted species are distributed all over the material. Crosslinking of the polyethylene may thus occur throughout the polymer upon hydrolyzation of the silane groups.

In contrast, the adhesive composition taught by Botros is a blend of two different functionalized polyolefins in a base resin. In such a blend, the different components do not necessarily mix, and the different functional groups are thus not necessarily evenly distributed throughout the material. This can affect the properties of the composition, in particular by limiting the crosslinking.

Therefore, it is respectfully submitted that neither Spears nor Botros disclose, teach or suggest an important feature of the present invention - the presence in the adhesive polymer layer of cross-lined polyethylene co-grafted with a silane compound and with an unsaturated carboxylic acid and/or a derivative thereof.

Further, it is respectfully submitted that one of ordinary skill in the art would not have arrived at the claimed invention by adapting the teaching of Botros. Indeed, Botros teaches the use of a cross-linked polyethylene only in conjunction with a separate adhesive layer within rather complicated structures. *See* [0039] of Botros. From this teaching, it is respectfully submitted that one of ordinary skill in the art would not have predicted nor expected that a simplified structure, such as the metal laminate as claimed, comprising a single layer of an adhesive polymer comprising a cross-linked polyethylene could lead to improved heat resistance compatible with subsequent treatments, such as cataphoresis, combined with satisfactory adhesion properties.

For at least the above reasons, it is respectfully submitted that claim 25 is patentable over the cited art.

Moreover, claims 26-48 depend from claim 25, and thus it is respectfully submitted that these claims are patentable over the cited art for at least the same reasons as claim 25.

In view of the above, withdrawal of the rejections is respectfully requested.


II. Conclusion

For the foregoing reasons, reconsideration and allowance of claims 25-48 is respectfully requested.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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